



AN
ESSAY
ON THE
UP TURE
CALLED
HYDROCELE:

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PRICE ONE SHILLING.

R54897

INTRODUCTION.

THE treatment of the Hydrocele, or watery rupture, has been a subject of discussion amongst many celebrated and ingenious surgeons.

The ancients had not so compleat a knowledge of anatomy, nor the physiology of the parts of generation, as the moderns; hence may be attributed their defective modes of treating not only the Hydrocele, but several other species of ruptures.

Amongst the moderns different opinions have prevailed in France, Italy, Holland, and England, as will hereafter appear.

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In this metropolis, surgeons of considerable merit and celebrity have dissented lately on the treatment of the Hydrocele.

THE PRESENT ESSAY CONTAINS :

- I. A brief anatomy of the genital parts, in order to convey precise ideas of the nature and situation of the disease.
- II. Observations on authors, containing an examination of the merits or defects in treating the watery rupture.
- III. Improved plans of cure are communicated, which are presumed to be less painful, more certain, and of course less objectionable, than those in general estimation.

HARLEY-STREET;
Oct. 14th, 1788.

A N
E S S A Y
ON THE
H Y D R O C E L E.

THE DESCRIPTION OF THE PARTS
AFFECTED.

AN anatomical explanation of the parts,
which come under the present consideration,
is necessary.

The Testicles.

The testicles are two oval glandular bodies
contained in the scrotum.

The Epididymis.

The epididymis is an appendix to the testicles,
the head of which is anterior, the *cauda*, or
extremity in the posterior part.

The Integuments of the Testicles.

1. *Scrotum*, a membranaceous cavity, divided into two parts by an intermediate membrane called *septum*, composed of the *epidermis cutis*, and a fibrous membrane called *dartos*.

2. *Tunica vaginalis*, is a cellulous membrane, beginning from the inguinal ring, and investing the spermatic chord and testicle.

This is originally formed by a process of the *peritoneum*, on the descension of the testicle, into the cavity of the scrotum.

The *tunica vaginalis* is composed of three membranes.

1. *Carnous fibres*, which proceed from the abdominal muscles; these form a muscle called *cremaster*, which elevates, lightly compresses, and, at times, forces out the seminary fluid.

II. Under the former, closely connected, is a second membrane, of a cellulous structure, arising from the peritoneal bag externally, which can be sub-divided into three tunics.

The *first* sub-division covers the spermatic vessels and testicles, called *tunica vaginalis communis*.

The *second* and interior contains the testicles loosely, and is drawn up to the uppermost part of
of

of the testicle, where the *epididymis* is seated, over which, and the testicle, it descends, and is very closely connected with it, and is nominated *tunica vaginalis testis propria*.

The *third* is called *tunica vaginalis propria funiculi*, which surrounds the spermatic vessels and *vas deferens*.

III. The last and innermost coat of the testicle is the nervous tunic, called *albuginea*; this contains the substance of the testicle, and confines it in such a manner, that it assumes an oval figure; the obtuser point of which is inclined downward, and a little inwards; the more conic end turns outwards, and a little upwards.

Thus what is called the vaginal coat, or *tunica vaginalis testis*, is composed of three coats, exclusive of the *albuginea*, that is immediately connected with the testicle itself.

All these can be demonstrated by maceration, minute anatomical injections, and inflation.*

Under

* III. Hallerus in epistola quadam ad Cl. Caldanum, ita mentem suam exposuit, vaginalem ego quidem persuadeor esse cellulosam telam exterius peritonæo circumpositam, in quam ex cavea abdominis via ducit, quæ solet in bono nato infante claudi.

Vaginalis autem ipsa in adulto homine propria vaginula albugineam operit; bullæ vero superiores connectentes vasa spermatica,

Under the fore part of the scrotum, the *tunica vaginalis* lies loosely on the albuginea; but on the back part, it adheres to this last-mentioned membrane: therefore, in the fore part the cavity is seated for the reception of whatever forms the hernia, or rupture, whether omentum, intestine, or water. This is of great consequence to be well understood.

3. The *tunica albuginea* of the testicle is of a whitish colour, and is concreted with the testicle itself.

The *substance* of the testicle and *epididymis* is tubular, and composed of numerous and most minute white canals, in a serpentine direction.

All these canals of the *epididymis* convey their fluid into one large canal, which is called *vas deferens*.

4. The *vas deferens* arises from the *cauda* or extremity of the *epididymis*, in the posterior part, and ascends with the spermatic chord, through the annular perforation of the inguin, or groin; terminating in the cavity of the *vesiculæ seminales*, or feminary *vesicles*.

spermatica, ita ad summum testem adhærescunt, ut caveam testis a suis bullis separent. Latiores demum bullæ et testem et vaginalem funiculi comprehendunt. Ita nascuntur tres vaginales.

5. The

5. The *spermatic chord*, therefore, is composed of the *vas deferens*, the *spermatic arteries* and *veins*, the *spermatic nerves*, the *lymphatic vessels*, and *tunica vaginalis* which is surrounded by the cremaster muscle.

The use of the *testicles* is well known to be for the secretion and preparation of the semen.

6. The *vesiculæ seminales* are two membranous receptacles, which receive and contain the semen brought by the *vas deferens*. The situation of them is oblique, between the rectum and neck of the bladder.

7. The *ductus ejaculatorius*, or ejaculatory seminal vessel, proceeds from each vesiculæ in the cavity of the *urethra*, and there, in the uppermost part of the *verumontanum*, opens by a peculiar orifice.

The use of the *vesiculæ seminales*, is to retain the semen, and by a convulsive force, eject it occasionally through the *ductus ejaculatorius* into the urethra, from whence, by the power of the accelerator muscle, it is emitted for the purpose of propagating the human species.

The anatomy of these parts being perfectly understood, the doctrines concerning the treatment of the Hydrocele, will be easily conceived.

OBSERVATIONS ON AUTHORS.

THE disorder was well comprehended to be in the scrotum, or within the membranes, by *Celsus*, above 1800 years since, and likewise the cure by incision, &c.*

Galen

* *Celsus de Med.* l. vij. c. 18.

Integris vero membranis interdum eam partem humor distendit. Atque ejus quoque duæ species sunt. Nam vel inter tunicas is increfcit vel in *membranis*, quæ ibi circa *venas et arterias* sunt ubi hæ gravatæ occalluerunt. Ac ne ei quidem humori, qui inter tunicas est una sedes est. Nam modo inter summam et mediam modo inter mediam et imam confistit, Græci communi nomine, quidquid est, *ὑδροκήλην** appellant: nostri vero, scilicet nullis discrimini-bus fatis cognitis, hoc quoque sub eodem nomine, quo priora habent.

Signa autem quædam communia sunt, quædam propria: communia quibus tumor deprehenditur; propria quibus locus.

Humorem subesse discimus, si tumor est, nunquam ex toto se remittens, sed interdum levior, aut propter famem aut propter febriculam, maximeque in pueris: isque mollis est, si non nimius humor subest; at si is vehementer increvit, renititur sicut uter repletus et arcte adstrictus; venæ quoque in scroto inflantur; et si digito premimus, cedit humor, circumfluentque id, quod non premitur attollit: et tanquam in vitro cornuve per scrotum apparet; isque, quantum in ipso est sine dolore est.

Sedes

Galen says, that the humour is to be evacuated by incision, and all extraneous substances removed. The wound is to be digested, and the affected part cicatrised.* Perhaps he in some instances found hydatids, which has also been remarked by *Morgagni de Sedibus et causis morborum*.

Rhazes recommends opening the scrotum, to evacuate the water monthly, if necessary.

Ægineta, in libro vi. cap. 62. remarks, that the fluid effused is sometimes turbid, therefore not to be discovered by means of a candle, &c. which *Celsus* likewise mentions.

Sedes autem ejus sic deprehenditur. Si inter summam mediamque tunicam est, cum digitis duobus premimus, paulatim humor inter eos revertens subit: scrotum remissius et albidius est; si ducitur aut nihil, aut paululum intenditur: testiculus ea parte neque visu neque tactu sentitur. At si sub media tunica est, intentum scrotum magis se attollit, adeo ut superior coles sub tumore eo delitefeat.

Celsus vij. 22. Herniæ aquosæ in ratione. Si vero humor intus est, incidendum est, in pueris quidem inguen; nisi in his quoque liquoris ejus major modus prohibet: in viris vero: et ubicunque multus humor subest, scrotum. Deinde si inguen incisum est, eo protractis tunicis humor effundi debet: Si scrotum, et sub hoc protinus vitium est, nihil aliud quam humor est effundendus, abscindendæque membranæ sunt, si quæ eum continuerunt. Deinde eluendum id aqua, quæ vel tuni salein adjectum vel nitrum habeat: si sub media, imave, tunica, totæ hæ extra scrotum collocandæ; excidendæque sunt.

* Method. med. 7 classis, p. 90.

Ambrosius Pareus mentions the cure of the Hydrocele by the seton, most probably from *Guido*.*

Rhodius advises the use of the cautery.

Zacutus Lusitanus cures the Hydrocele by conveying the effused humour through a syphon, after perforation.

Dionis, that most excellent French surgeon, after describing the disorder, and supposing it does not cede to remedies, such as resolvent cataplasms, &c. treats of three palliative modes of cure; the puncture by a lancet; the seton; and the perforation by a trocar. The cautery he considers a radical cure, and prefers it to the other three methods.

* *Pareus de tumoribus contra naturam*, l. vij. 183.—
Hydrocele aquosus tumor est in scroto.

Quod si tumor propter ingentem aquæ vim remediis illi, non ceperit chirurgia opus est, scroto et membranis quibus aqua concluditur, *feto trajectis*, traducta nempe acu crassifscula mucrone triangulari serium filum multiplex ducente. Céleriter autem per forcipis fetis dicatæ foramina traduci debet, intacta testium substantia. Filum vero ibi relinquendum, atque bis tervè in die commovendum, ut sensim humor stillet et evacuetur. Quod si setæ occasione dolor acerbior et inflammatio superveniant, quamprimum illa tollenda erunt et morbi propria cura neglecta symptomatis occurrendum. Pragmaticorum nonnulli seta non utuntur, sed novacula vel scalpello scroti partem imam, vulnere dimidium digitum longo aperiunt, ad conclusam usque aquam penetrantes.

M. de

M. de la Faye observes, in a note, that in consequence of the inconvenience of the caustic, that the practitioners had abandoned that method of treatment, and preferred the incision with a bistory; and suppurating the membrane with digestive ointments.*

It is very evident the great practitioner in surgery, *Dionis*, whose experience was very extensive, and whose judgment and probity can be relied on, considers the seton only a palliative cure.

Ruyseh and *Marinus* advise opening the superior part of the tumor in the Hydrocele, and then a tent about three inches long, is to be introduced, with an ointment, to which is added some *mercurius præcipitatus ruber*. This application causes suppuration, and the putrefaction of the membranes, which *Ruyseh* declares has often proved a cure of the disorder.†

Heister mentions the methods of cure, both palliative and radical, as puncture, seton,

* *Dionis* Cours d'operations de chirurgie, pag. 369, 370

† *Ruyseh* says, Si curationem aggredieris, aperiendo scrotum a parte superiore, ad latus tumque vulnus turunda oblonga unguento rosaceo, mercurio præcipitato rubro permixto inuncta oppleveris, donec lenis inflammatio eique succedens suppuratio parva membranulas stillantes putrefecerit, tumque eas tenaculo eduxeris, sæpe deinde perfecte sanatum observavi.

caustic, actual and potential, injections to promote suppuration : he objects against the seton, lest the testicle might be diseased, or an adipose substance requiring removal, and is not surprised that celotomia is preferred to the use of the seton, by most practitioners.

Mr. *Samuel Sharpe*, whose experience was immense at Guy's Hospital, and likewise in private practice ; prefers the palliative cure, as attempting the radical, was attended with danger, and very untoward symptoms ; he disapproves of the seton, observing, " that it " cannot be so efficacious as incisions, and will " be much more apt to become troublesome, " and even to *gangrene*." This great practitioner thinks the operation by incision very hazardous, and scarce warrantable, " unless " to such patients who are inconsolable under " the distemper, and are willing to sustain any " thing for a cure." He observes the *puncture* of a *lancet* has proved an absolute cure, by exciting an inflammation.

• *Le Dran* mentions the convenience of the palliative cure for adults, as the radical requires confinement five or six weeks.

The radical cure is to make an incision the whole length of the *cystis*, avoiding the spermatic vessels, &c.

Mr.

Mr. *Percival Pott*, surgeon to St. Bartholomew's hospital, considers the seton as a radical cure by an improvement in the method of operating.

This manner of operating, however, is more complex than any; more instruments are used; which by no means agrees with that simplicity in surgical practice, which is the characteristic of the most cultivated modern surgery.

First. The inferior and anterior part of the tumor is pierced with a trocar.

Secondly. The perforator is withdrawn.

Thirdly. The water is evacuated.

Fourthly. The seton canula is passed through the trocar canula.

Fifthly. The seton canula is to be directed upwards, until it reaches the upper part of the *tunica vaginalis testis*, and is to be felt in the very upper part of the scrotum.

Sixthly. The seton, probe, or pointed needle, is to be conveyed through the seton canula, and the vaginal coat and integuments pierced through, so that this long instrument may be drawn all through the last wound externally.

Seventhly. The seton, or large skain of silk, containing many threads, is then to be drawn through the inferior and superior wounds.

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The *canula* is then withdrawn, and the skain of silk being held in the upper part, is left in the wounds, an end of which hangs out of each orifice; thus the operation finishes.

Mr. *Pott* then orders twenty-five drops of laudanum; and the patient is conveyed to bed.

The seton is left untouched, and about
 “ the third day the *scrotum* begins to inflame
 “ and swell, and put on the appearance of an
 “ *hernia humoralis*, or swelled testicle, which
 “ now and then attends a *clap*.”

This is directed to be treated similarly.

Mr. *Pott* then recommends the *cortex peruvianus*: about the twelfth day, some threads are withdrawn; for in general, after the operation, they adhere to the *tunica albuginea* of the testicle, or *tunica vaginalis testis*, so firmly, as to make it irksome to remove the seton.

The discharge from the wounds, Mr. *Pott* says, is small and trifling.

The superior advantages of this method are, according to Mr. *Pott*;

I. The preservation of the membranes, namely, the *tunica vaginalis* and *albuginea*.

II. The inflammation excited by the extraneous body, remaining ten or twelve days, meaning the skain of silk in the wounds, is the cause of an union of the detached membranes.

III. This

III. This union proves the radical cure; for by the inosculation of the fibres of each, or growing together of the two membranes, which before formed a cavity for the reception of the water; any future accumulation is prevented, by the total destruction of the receptacle.

IV. This, Mr. *Pott* affirms, is effected without the suppuration, or destruction of the membranes; whereas all practitioners, who use the caustic, acknowledge the tunics, or whole cyst are destroyed.

The words of Mr. *Pott* are, “ In the cure
“ by the seton no *slough* is produced (at least I
“ have never seen one) nor is the vaginal coat
“ *destroyed* in *any part* of it; a firm cohesion is
“ made by the two membranes, occasioned by
“ the inflammation, and the cure is effected
“ solely thereby.”

THE DEFINITION OF THE
HYDROCELE, &c.

THE *Hydrocele*, or watery rupture, as it has been called, is an accumulation of lymph, or serum, in the scrotum.

The Hydrocele may be divided into two species, from the seat of the disease, or part in which the lymph, serum, or water, is effused.

I. The *Hydrocele* of the integuments of the scrotum; in which the water is contained in the cells of the *tela cellulosa*; the whole scrotum and membrum virile are œdematous, that is, retains the vestige of the finger on pressure. This species commonly accompanies the anasarcaous dropsy.*

II. The *Hydrocele vaginalis*; water effused in the vagina of the spermatic chord, or the vagina of the testicle.

* There is a species of Hydrocele mentioned by most authors until lately, in which the water was supposed to descend into the abdomen from the ascites; taking its residence between the under part of the cellular tunic of the scrotum, and the external part of the tunica vaginalis; but this opinion has been clearly proved, in general, fallacious.

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In the first, the tumor is towards the abdominal ring; in the second, a tumor commences in the *fundus* of the scrotum.

The parts therefore, in the Hydrocele, which principally become the objects of consideration, are the *tunica vaginalis testis*: the *spermatic chord*, the *testicle itself*; parts liable to great irritability, pain and inflammation, from any stimulating cause. Operations, therefore, should not be attempted on slight grounds; they should always be avoided, unless in cases of urgent necessity; and when there is the greatest probability of curing effectually the complaint, or palliating it with safety, so as to render life more comfortable.

According to different opinions amongst surgeons, there is scarce any method of treating the Hydrocele, that is not in some respects, objectionable.

Objections to the incision.

The exposure of the parts, the subsequent inflammation of the testicle and its appendages, and sometimes a gangrene, or mortification.

Objections to the tent as formerly practised.

The confinement of the matter within the cavity, the inflammation that follows with
D exquisite

exquisite pain in those tender parts, and sometimes worse consequences, without obtaining a radical cure.

Objections to the application of a large caustic.

The actual cautery, or burning red hot iron is, I believe, universally exploded ; but the *lapis infernalis* and other potential caustics act in a similar manner to fire, by totally destroying the parts on which they are applied.

The uncertainty of their strength is an objection to the use of caustics in these parts ; for if they penetrate through the *tunica vaginalis*, and some particles of the caustic should get into the *sac*, and act on either the spermatic chord, or *tunica albuginea* of the testicle, which has happened, terrible inflammations, destruction of parts, &c. might ensue. This is experienced, where, by accident, the matter composing the caustic liquifies in the atmospheric air, and extends its action beyond the bounds of the defensive plaister.

Other disagreeable circumstances in the use of the common caustics are, the exquisite pain they occasion, the inflammation and suppuration that follow. Sometimes they so materially injure the *epididymis* or excite such inflammation and schirrosity in the testicle, as to render castration necessary ; an operation dreadful

to reflect on ; in which, no surgeon, however skilful, can promise success. If the patient expires, the surgeon should reflect, that he hastened death, by rashly attempting to cure a disorder, which is frequently slow in its advances, and can be endured many years, merely, by a suspending bandage, or the palliative evacuation of the fluid, without any great inconvenience.

Many of these objections, however, have been obviated by the application of a small caustic, as recommended by the late ingenious *Mr. Else*, surgeon to St. Thomas's hospital.

Objections to the seton as formerly practised.

The seton as formerly practised, in which a tape, or ribbon were dragged through, and left in the wound, was attended with evil consequences to such tender and sensible parts ; amongst which might be enumerated exquisite pain, violent inflammation, schirrous, mortification, &c. or failure in the radical cure, as the disorder has returned after the use of the seton*.

* See *Dionis, de la Faye*, and *Elsé* on the Hydrocele.

Objections to the seton as practised by the ingenious and expert Mr. Pott.

The operation itself, through the variety of instruments used, is rendered very complex, and a violent inflammation follows; on which depends the cure. The consequences of such inflammation can never be foreseen, as many surgeons can testify, who have performed this operation at hospitals, and in private practice.

It has not succeeded in producing a radical cure, of which there are many instances, *Mr. Pott advances, “*That the membranes are left intire and uninjured;*” this, every reflecting surgeon must know, is impossible.

For the operation does not succeed without a coalescence of the *vaginal coat* with the *tunica albuginea*, of course the membranes are not intire.

The union cannot happen without an inflammation and inosculation of the fibres of each membrane.

No inosculation of the fibers can be effected, without the inflammation is sufficiently powerful to cause an erosion of the lamina of the external surfaces of both membranes.

In scalds or burns, while the cuticle remains on two proximate fingers, no inosculation

* *Else on the Hydrocele.*

tion can happen; but the cuticle being removed, and the arteries pouring out their humidity, from the lateral surfaces of two fore fingers if bound together, they will first lightly cohere, and afterwards grow together; it is therefore a rule in surgery to dress scalded fingers separately. On this principle *Tagliacotius* the creator of noses, performed his operations, on the same principle the cure of the hare-lip is effected: the callous edges of which are first cut, then being brought in contact they cohere, but never while the skin or edges are intire.

With the utmost respect, therefore to this celebrated surgeon, it may be affirmed without hesitation, that in the cure by the seton, the membranes do not remain intire; but previous to an union, suppurate, in a certain degree, have their surfaces abraded, or they cannot concrete. It seems then, *Mr. Pott* has been mistaken in this particular. Besides, the internal surface of the vaginal coat exhales a fine vapour, which probably facilitates the action of the testicle, in coition, when it is much elevated by the contraction of the cremaster muscle, &c. If the membranes, which were smoothly gliding against each other, with their moistened surfaces, become united, by the consequences of inflammation, erosion, and coalescence, they no longer are two separate membranes, but by this artificial union, form *one membrane.*

brane. The power of exhaling the vapour in the vagina is destroyed, because the surfaces of the vagina, as originally formed, from which a fine fluid issued, are obliterated ; hence it cannot be asserted, that the membranes remain *intire* * after the operation, but just the reverse. This want of precision would not have been mentioned, but *Mr. Pott* insists on the circumstance of the membranes being preserved *intire*, as a principal *desideratum* in his operation ; which, every reflecting surgeon must well know is never the case, whenever the operation of the seton succeeds.

The membranes then, neither remain *intire*, nor exhale from their surfaces the fine vapour which lubricates the vaginal coat on its inner surface, and the albuginea externally.

The strongest objection, however, against *Mr. Pott's* favourite practice of the seton is, that patients are sometimes disappointed, after exquisite pain, and loss of time, of a radical cure ; for it is now known the disorder has returned, in cases where *Mr. Pott* himself performed the operation†.

* The precise meaning of *intire*, which comes from *integer*, and this word from *in* and *tango*, or *tango*, is whole, sound, untouched, &c. A part cannot be called *intire* or untouched, when its original uses are destroyed, or an artificial coalition is produced, in parts formerly separated.

† See *Else* and *Vaux*.

The

The seton has likewise been tried by many celebrated surgeons, but through the dangerous symptoms that followed, many have been deterred from repeating it, and are favourers of the application of a small caustic, or the palliative cure by puncture, either with a lancet or small trocar.

The objections to the palliative methods of cure by the puncture of a lancet, or trocar.

These methods can only be objectionable on account of their not radically curing the hydrocele; but their safety renders them in many instances of advanced life, with infirmity of body, superior to the other modes recommended. In the radical cure it must be confessed, much hazard is frequently experienced, in the palliative, little or none, unless the patient's constitution should be debilitated by dropsy, &c. in which case neither the radical, nor palliative methods should be used for mortification and death are frequently the consequences.

The late *Mr. Else*, surgeon to St. Thomas's hospital, a most excellent anatomist, published some years ago a method of treating the Hydrocele, or watery rupture with a small caustic, in the following manner.

i. A defensative plaister is first applied to the scrotum with a circular perforation about the size of a sixpence on the anterior, and lower part, avoiding the testicles.

ii. Narrow long slips of adhesive plaister are placed all round this perforation, one over the other, to about the thickness of the eighth of an inch.

iii. These narrow slips are to be snipped with scissars at little distances half through their breadth, that they may be conveniently fixed in a circular manner round the perforation, on which the caustic, is intended to be placed.

iv. The patient lies on his back, the caustic is applied to the circular perforation; and over the caustic, an adhesive plaister.

v. A double headed roller is then passed round the body, one end of which is carried between the legs, and surrounds the caustic.

vi. The caustic is to lay on from five to even twenty-four hours.

When the caustic is removed, the black eschar appears about the size of a shilling, as the caustic commonly spreads farther than the limits of the perforated defensative plaister,
for

for sometimes it even extends to the size of half a crown*.

In two or three days, pains are perceived in the back and loins, with a symptomatic fever.

The scrotum is a little inflamed, and hardens.

These symptoms yield to venæsection, opening clysters, cooling regimen, and remedies.

In a few days the eschar on the scrotum loosens and is thrown off.

The *tunica vaginalis* appears rather protuberating, and being punctured with a lancet, the water contained in the sac is evacuated.

A suppuration succeeds, and slough follows slough for near four or five weeks; during which time, the part is suspended in a bag ruffs, and the patient is allowed to walk.

* The composition of the caustic is, as follows.

℞. Lixiv. Sapon. Pharmacop. Lond. ℥xxxij.

loque ad ℥viiij. adde

alc. viv. pulv. ℥iij.

extract. Thebaic. pulv. ℥j. donec omnem, liquorem absorberit, ut fiat pasta, quæ vase optime clauso fervari debet.

The tumor of the scrotum diminishes both in size and hardness, in proportion to the separation of sloughs, and quantity of discharge.

The wound heals kindly, and there can be no objection to its being cicatrised too soon, as the cure is no less certain from this circumstance. *Mr. Girle*, surgeon of St. Thomas's hospital, practised this method nineteen years with great success, in the hospital.

Mr. Baker, surgeon of the same hospital, likewise, for twenty nine years, successfully applied the caustic, even larger, and generally succeeded.

The ingenious surgeon, *Mr. Way*, successfully pursued the same mode of treatment at Guy's hospital, to which noble charity he has been surgeon a great many years; amongst the patients were two, seventy years old. The caustic radically cured the disorder, in both instances.

The caustics have been likewise applied fortunately to the double Hydrocele; and when complicated with other species of hernia. A comparative trial of the merits of the caustic and seton has been an object of impartial enquiry. The result has demonstrated superior advantages of the small caustic over *Mr. Pott's* seton. These facts are so well known, and confirmed

confirmed by the joint testimony of many impartial surgeons, that it would be superfluous to dwell any longer on the subject.

From hence it is very evident, that the incision, or large caustics are dangerous; the tent as formerly practised, and the seton, of doubtful success, painful, and in many instances, hazardous. The palliative cure by the trocar, or lancet, merely to discharge the water, not satisfactory, though safest; the small caustic, recommended by *Mr. Elſe*, therefore, may be considered superior to all other methods; but this is capable of considerable improvement, as will appear in the sequel.

Before the method to be proposed in this Essay is introduced, the characteristic symptoms, which distinguish the Hydrocele from other species of ruptures, should be explained, the prognostics, &c.

The diagnosis, or distinguishing symptoms of the Hydrocele.

An Hydrocele may be known :

1. From a dropsy of the scrotum ; for the latter pits, or leaves the impression of the finger, on pressure, like the anasarca of the legs ; the skin is smooth, and the penis commonly swelled. Whereas in the Hydrocele of the *tunica*

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vaginalis,

vaginalis, the penis commonly contracts, the skin is rougher, unless the tumor be very large, and the swelling leaves no pit.

11. An Hydrocele, or watery rupture, is distinguished from an *enterocele*, or intestinal rupture, *epiplocele*, or omental rupture, by the following symptoms.

Both these ruptures return into the abdomen on the patient's lying down, and gently pressing the swelling, unless they adhere to the vaginal coat, or are in a state of strangulation from the resistance made to their reposition, by the abdominal ring, in which there is commonly pain, inflammation, obstructed feces, and imminent danger. The Hydrocele does not move upwards; but is confined in the vaginal coat immediately under the scrotum: nor does an horizontal posture, or pressure, diminish the tumor.

The tumor of the *epiplocele* and *enterocele*, can be followed with the fingers, up the groin, through the ring of the abdominal muscles: the limits of the *Hydrocele* do not extend to the abdomen.

The Hydrocele is likewise distinguished by the fluctuation, or undulation of the contained fluid, on gently striking the part with the fingers,

fingers, and pressing the opposite side with the other hand.

III. The *hernia humoralis*, is known by solidity, weight, pain, and inflammation of the testicle itself, &c. symptoms which rarely or never accompany an Hydrocele; unless complicated with a diseased testicle. The *hernia humoralis*, arises from venereal infection, the Hydrocele never.

The Hydrocele tumefies the vaginal sac to a large degree, like a bladder inflated, or distended with water; whereas the *hernia humoralis* is very hard, but seldom of extraordinary bulk, except it becomes a scirrhus, or cancerous tumor, which is easily discovered by hardness and inequalities, &c.

The placing a candle behind the scrotum, is no infallible sign, though recommended by many authors: for the fluid may be turbid, bloody, &c. from which circumstance, transparency is diminished; however, this criterion should never be neglected.

It may likewise be observed, that the *spermatic chord* is seldom diseased in the Hydrocele, and the penis is generally shortened, so that, in many instances, the act of generation is rendered very troublesome, or altogether impeded.

The

The ruptures of the *intestines* or *omentum*, descend through the abdominal ring, groin, and into the vaginal sac, whereas the fluid of the Hydrocele is first in the lower part of the scrotum, gradually ascends by increase without pain, and never or very rarely communicates with the abdomen, unless in the dropfy called *ascites*, which some authors mention, but which I have never seen.

The *intestinal* and *omental* ruptures commonly originate in some sudden exertion, such as jumping, running, &c. On the contrary, the Hydrocele is seldom rapid in its progress, the tumefaction almost imperceptible, unless arising from a blow.

The remote causes of the Hydrocele, are :

I. An impoverished lax, and ferous state of the blood, from hæmorrhages, profuse evacuations, debility from fevers, &c.

II. Blows on the scrotum, contusions, inflammation of the *testicle*, *epididymis*, or *vaginal sac*, terminating in debility.

III. Relaxation of the genital parts, from excessive venery.

The immediate causes.

An accumulation of fluid in the *tunica vaginalis testis*, arising from different sources.

I. An increased exhalation of the vapour, which lubricates the membranes.

II. A diminished absorption, or inhalation of the fluids exhaled.

III. A rupture of lymphatic vessels, by which coagulable lymph is deposited in the cavity, between the inner surface of the vaginal coat, and *tunica albuginea* of the testicle.

The increased exhalation, may arise from inflammation subsequent to blows, bruises, &c. The mouths of the capillary veins may be relaxed, so that their absorbing powers are destroyed; hence accumulation without any means, or powers by which the secreted superfluous fluids may be carried back to the venal system.*

* It is here denied, that there is only one absorbent system, for it has been proved by a very great physiologist, lately, that the lymphatics only absorb coagulable lymph; but the minute sanguiferous capillary veins absorb saline and volatile particles; neither of which are found except in very small portions in coagulable lymph.

Two species of fluid are found in the hydroptic sac, in different cases; a thin serum, not coagulable, which by exhalation, or evaporation, goes chiefly off in vapor: the other species is coagulable in an heat of 114, in which it is known the true coagulable lymph coagulates, like the white of an egg.*

It is this last species, that forms hydatids, and in other parts, the same fluid congealing creates the *polypi*, steatomatous, schirrous tumors, &c. circumstances little attended to by surgeons; but on which, the most certain prognostics may be founded in practice.

Prognostics of the Hydrocele or watery rupture.

I. The prognostics of the Hydrocele may be rationally founded on the nature of the case and causes, which produced the fluid in the *vaginal sac*.

II. From considering the patient's age, constitution, bodily health or infirmities, whether the disease be simple or complicated, single or double, recent, or of long duration.

III. From the size of the tumor, whether large or small; the state of the *tunica vaginalis*,

* This has been discovered by repeated experiments.

whether thickened or not, whether the *testes* be in a sound or diseased state, and whether fluid is contained under the *tunica albuginea*, exclusive of that occupying the *vaginal sac*.

I. In old age, attended with *ascites*, or *anæsarous* dropsy, neither the radical nor palliative cure should be attempted, lest gangrene, or mortification follow.

II. When no important bodily weakness, nor infirmities are attendant, and the disease is simply an accumulation of fluid; the radical cure may be safely undertaken.

III. The disorder when recent is easier cured than when of long duration, and if *serum* deposited, the re-absorption is more likely to follow even judicious internal treatment, than when a lymphatic vessel is burst; for in this last case, the supply and increase of the fluid cannot be prevented, and from the viscosity of coagulable lymph, the absorption may be less expected.

IV. The state of the *tunica vaginalis* whether thickened or not, has not much impeded the cure by caustic.

V. The *testicle* being in a sound state, is more to be wished, than disease of that organ, especially if cancerous; for in the latter

case the cure sometimes will not prove effectual without castration. The operation in such instances for the radical cure of the Hydrocele, had better be avoided.

VI. Fluid under the *albuginea* has been evacuated by puncture without mischief in some, in others, dreadful consequences have followed.

VII. It should be observed, that persons live many years without danger, or any great inconvenience from the Hydrocele; especially if a judicious diet, and proper remedies be prescribed. The disease, therefore, not being, in many instances, urgent, the surgeon should not be very solicitous for operation, until all other methods have been tried without effect.

ON THE CURE OF THE HYDROCELE.

THE *cure* of the Hydrocele is attempted by three methods of treatment.

I. By medicines externally, and internally applied.

II. By the palliative mode of treatment.

III. By the radical cure.

The remedies of the external kind are discutient warm fomentations, lotions, &c. as strong solutions of *camphor*, *spiritus mindereri*; solution of volatile or crude *sal ammoniac* with *vinegar*, or *linimentum saponaceum*, *aq. calcis*, &c.

To which must be added the proper suspending bandage, for the support of the part.

If arising from relaxation, the cold bath is an excellent remedy; or partial and frequent cold bathing of the part in water, made colder by a solution of *sal ammoniac*, *nitre*, or *ice*.

Internally the *cortex peruvianus*, *steel*, or other tonics, antimony and mercurials joined as alteratives, are generally proper.

These methods, I have known to succeed in curing some cases of the Hydrocele, and other dropfies.

First improvement in the cure of the Hydrocele.

The *palliative* cure by a puncture is most proper for the timid, or those who cannot suffer confinement, and may be repeated occasionally with safety; but it is necessary here to introduce an improvement, which has been practised with success. It has in some instances proved a radical cure.

The method is this, after the water is evacuated either by the lancet, or trocar, the last instrument is however preferable; I introduce a small sponge tent about half an inch in length, into the perforation, this I repeat daily twice a day, to discharge any matter or water that might be accumulated after the operation. If pain, or too great a degree of inflammation succeed, the tent is immediately withdrawn, and introduced again occasionally, to keep up a sufficient degree of inflammation, to cause an adhesion of the two tunics, and to prevent the healing of the wound.

This method has radically cured the Hydrocele without that violent pain, inflammation and other alarming symptoms, which generally

generally attend the use of the seton, as recommended by *Mr. Pott*.

The seton often cannot be removed, let the inflammation be ever so violent, this *Mr. Else* and other eminent surgeons have experienced; which difficulty is now intirely removed by the use of the tent, being always anointed with some emollient ointment, and is removable at pleasure, which method I consider equally as certain in its producing a radical cure as the seton. According to the size of the tent, that is used, so will the inflammation be more or less, which can, by taking out the tent, be lessened at pleasure; This method when better known, will be considered, I hope, a real and beneficial improvement in the treatment of the Hydrocele.

Second improvement in the cure of the Hydrocele.

In the part whereon *Mr. Else* recommends his caustic, a defensative plaister is first applied.

The circle of the defensative plaister is almost filled with a circular plaister, so as only to leave a narrow circular ring on the skin.

Instead of using the caustic that the late ingenious surgeon, *Mr. Else* recommends, I dip a
piece

piece of lint into *concentrated nitrous acid*,* which I apply to the circular ring made in the defenſative plaſter; this application answers all the purpoſes of any cauſtic, with leſs pain to the patient, and more certainty, as to its effects.

For, *fiſt* it produces an inſenſibility in the parts, without any ſurrounding inflammation.

Secondly, As the *concentrated nitrous acid* is only applied on a narrow circular ring formed by the defenſative plaſter; it does not deſtroy but a very ſmall ſurface of the ſcrotum; yet answers every purpoſe, as though the cauſtic acted on the whole ſurface of the circle as practiſed by *Mr. Elſe*.

Thirdly, It may be uſed gradually, until the part of the ſcrotum deſtined to be deſtroyed, comes off in a compleat eſchar; the limits of which, it is in the ſurgeon's power to determine.

Fourthly, It cannot operate farther, nor ſpread its effects to a greater circumference than the operator approves.

* By the *concentrated nitrous acid*, I mean the red ſuming ſpirit that comes over in the diſtillation of *ſpiritus niri Glauberi*, ſeparated from the phlegm, and weaker particles of the ſpirit. The bottle that contains this ſpirit ſhould be well ſtopped with a glaſs ſtopper, exactly ground, as it is very volatile.

Fifthly,

Fifthly, When the eschar on the scrotum is removed, the sac or tunic containing the water, can be soon destroyed to any extent, by the application of the *concentrated nitrous acid*; so that the lancet is unnecessary, and the part of the membranes to be thrown off, is easily accomplished.

Sixthly, There can be no dread from the matter composing the caustic, penetrating deeper than is intended, or injuring the spermatic chord, inflaming the *albuginea*, or the testicle, &c. for all these mischiefs are positively avoided by this method.

Seventhly, Mr. Pott's principal objections to the use of the caustic are removed, and the symptoms of inflammation, that would follow the use of Mr. Else's caustic, are much lessened, though the cure, in general, proceeds in a similar manner.

If any other caustic be applied to the Hydrocele, it will be found more eligible to adopt the *circular ring* plaister; as the smaller the surface is, on which the corrosive acts, so must the pain be proportionably lessened.

The happy consequences of this improved practice are superior to the common caustics, being more certain, less painful, and horrid to patients,

patients, and more congruous to that humanity, which should ever influence the whole art of surgery.

These methods, then, are respectfully submitted to the impartial consideration of surgeons who are disposed to listen to improvements, and who will candidly compare without any predilection to favorite doctrines, the methods here recommended, with those older plans of treatment in more general esteem. If this comparative view should induce other surgeons to attempt, what I have found in general useful, and without reserve communicated; the purposes for which this little Essay is written, will be answered, and mankind labouring with this disagreeable disorder, ultimately receive the advantages intended for their benefit.

It may be necessary to add, that the same preparation is excellent for the opening venereal buboes, or other abscesses in general; especially, if the *circular ring caustic* be adopted, by means of the defensative plaister already described. Excrescences of every sort can be removed, by this means, as the piles, &c. nor is this preparation without its uses in the *fistula in ano*, the treatment of which may perhaps be the subject of a future essay.

F I N I S.

